

Application serial No. 10/709,167
Examiner: VO, THANH DUC
Art Unit: 2189

Applicant: Ming-Nen Liang

IN THE CLAIMS

Please amend the claims as follows.

1. (currently amended) A storage controlling and judging method of a flash memory for writing data to said flash memory, the flash memory comprising a plurality of sets of mother and child blocks, each set of said mother and child blocks having a mother block and a child block corresponding to said mother block for increasing data storage speed of said flash memory and using a correlation between said mother block and said child block of said sets of mother and child blocks to substantially reduce erasing frequency of said flash memory for extending a service life thereof; the method comprising:

(a) receiving writing command;

(b) checking whether an address to be written is in said sets of mother and child blocks, wherein if the address to be written is not in said sets of mother and child blocks, proceed to step (c), and wherein if the address to be written is in said sets of mother and child blocks, proceed to step (e);

(c) checking whether said flash memory has a plurality of sets of mother and child blocks, wherein if said flash memory has the plurality of sets of mother and child blocks, proceed to step (d);

(d) judging whether numbers of used sets of mother and child blocks reach a preset number in a manager, wherein if the numbers of the used sets of mother and child blocks do not reach the preset number in said manager, one of the used sets of mother and child blocks is found and combined to create a new block, a blank block is found and defined as a child block, and a block defined for writing as a mother block, and then said mother block and said child block are combined to create a new set of mother and

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child blocks, then proceed to step (f e);

(e) executing writing;

(f) executing writing from pages in said child block of said set of mother and child blocks;

(g) executing writing into said pages;

(h) judging whether a written page is a last page in said child block, wherein if the written page is not the last page in said child block, proceed to step (i);

(i) judging whether to continue writing into said pages, wherein if not to continue writing into said pages, proceed to step (j); and

(j) end writing operation.

2. (previously presented) The storage controlling and judging method of the flash memory according to claim 1, wherein the operation proceeds to step (l) if said flash memory does not have the plurality of sets of mother and child blocks in said step (c);

(l) a blank block is found and defined as a child block, and said mother block and said child block are combined as a new set of mother and child blocks, then proceed to step (e).

3. (previously presented) The storage controlling and judging method of the flash memory according to claim 1, wherein the operation proceeds to step (k) if the numbers of the used sets of mother and child blocks do not reach the preset number in said manager in said step (d);

(k) a blank block is found and defined as a child block, and a block for writing is defined as a mother block, and then said mother block and said child block are combined as a new set of mother and child blocks, then proceed to step (e).

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4. (currently amended) The storage controlling and judging method of the flash memory according to claim 1, wherein the operation proceeds to step (m) if the written page is the last page in said child block in said step (h);

(m) said set of mother and child block is combined as a new set of mother and child blocks and a mother block and a child block in said set of mother and child blocks are erased, then proceed to step (n i) to judge whether or not to continue writing into said pages, if to continue writing in said pages, proceed to step (b g).

Claim 5 (canceled).

6. (previously presented) A storage controlling and judging method of a flash memory for writing data into said flash memory, said judging method comprising:

(i) starting the judging method;

(ii) checking whether a starting page R for writing is at or ahead a valid-starting page N in a child block of a set of mother and child blocks;

wherein if the starting page R for writing is at or ahead the valid-starting page N in the child block of the set of mother and child blocks, proceed to step (iii);

(iii) comparing whether an ending page S for writing is at or behind valid-ending page M in said child block of said set of mother and child blocks;

wherein if the ending page S for writing is at or behind the valid-ending page M in said child block of said set of mother and child blocks, proceed to step (iv);

(iv) erasing said child block and replacing a new block to create a child block and writing data therein; and

(v) ending the judging method.

7. (previously presented) The storage controlling and judging method of the flash memory according to claim 6, wherein if the starting page R for writing is not at or

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ahead the valid-starting page N in the child block of the set of mother and child blocks in said step (ii), then check whether said starting page R for writing is behind said valid-ending page M in said child block of said set of mother and child blocks;

wherein if said starting page R for writing is behind said valid-ending page M in said child block of said set of mother and child blocks, proceed to step (vi);

(vi) pages (M+1) to (R-1) are copied from said mother block of said set of mother and child blocks to said child block, and continued to write data therein; otherwise, if said starting page R for writing is not behind said valid-ending page M in said child block of said set of mother and child blocks, proceed to step (vii);

(vii) said mother block and said child block of said set of mother and child blocks are combined as a new mother block, then a new child block is created to join said new mother block as a new set of mother and child blocks to continue writing data, and proceed to step (v).

8. (currently amended) The storage controlling and judging method of the flash memory according to claim 6 7, wherein if the ending page S for writing is not at or behind the valid-ending page M in said child block of said set of mother and child blocks in step (iii), proceed to step (vii).